FIG. 1

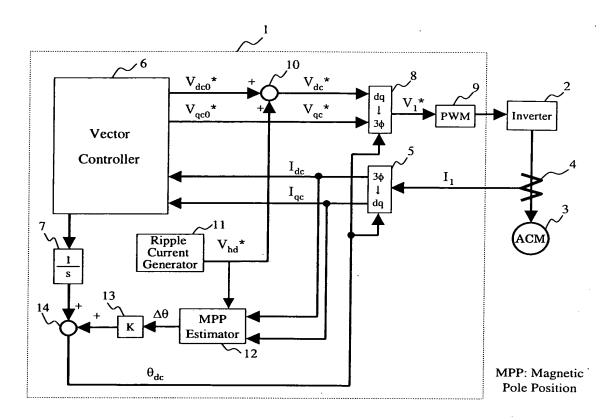
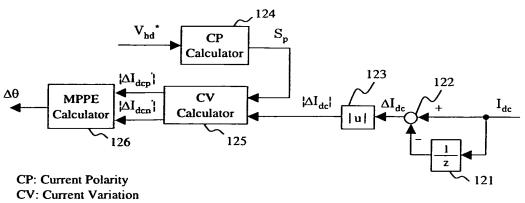


FIG. 2



MPPE: Magnetic Pole Position Estimation

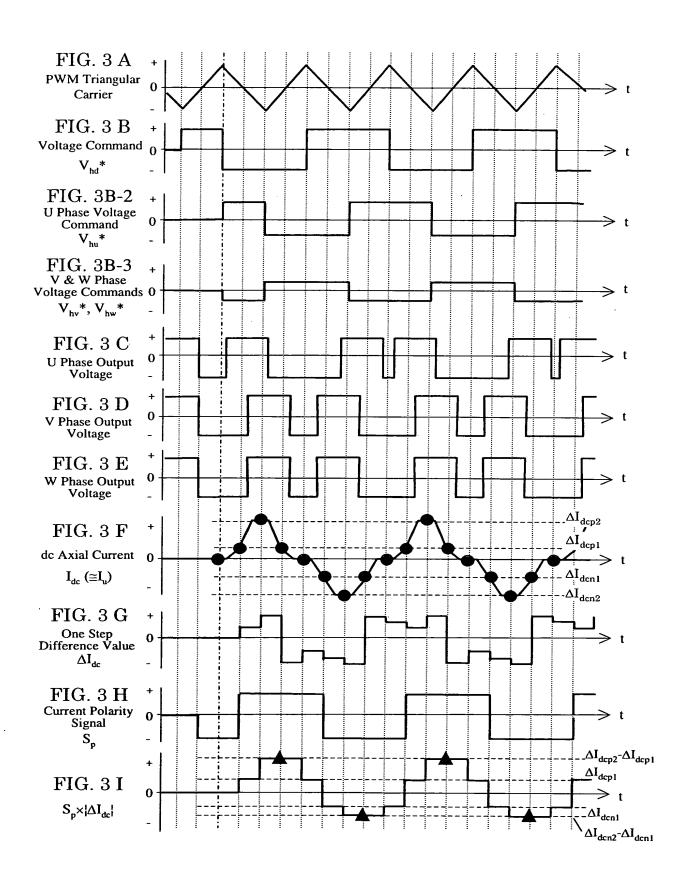


FIG. 4 A

Internal View of Motor

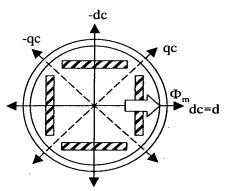


FIG. 4 B

## Saturation Characteristic

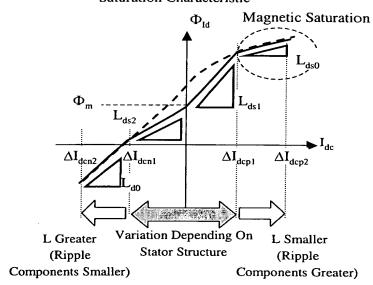
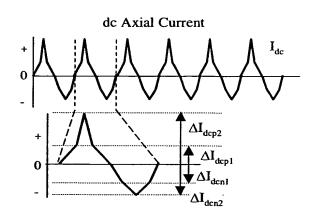
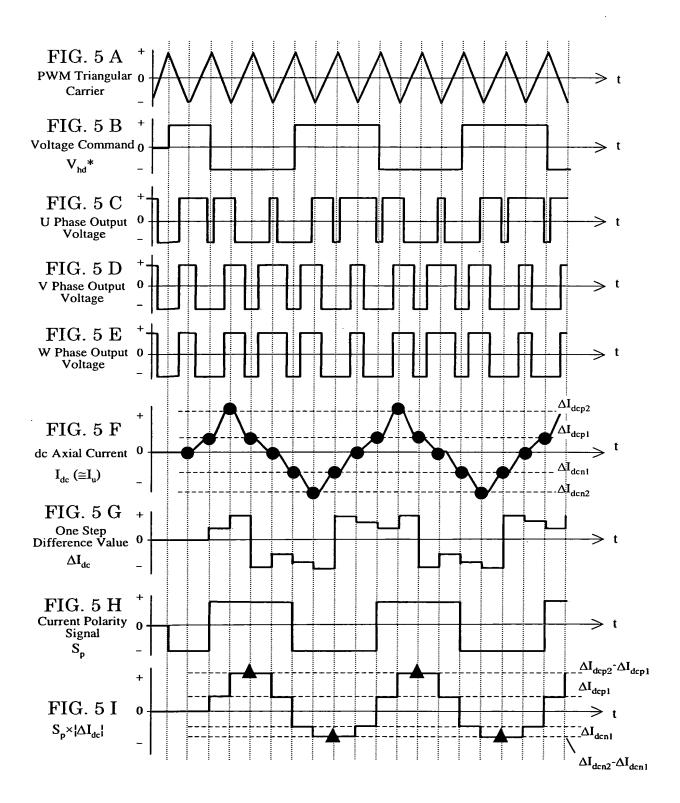
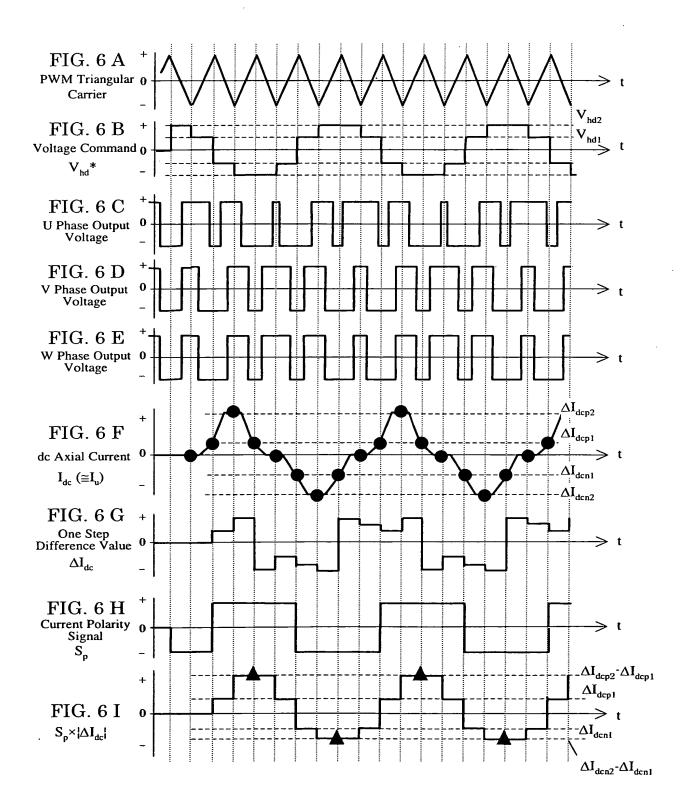


FIG. 4 C







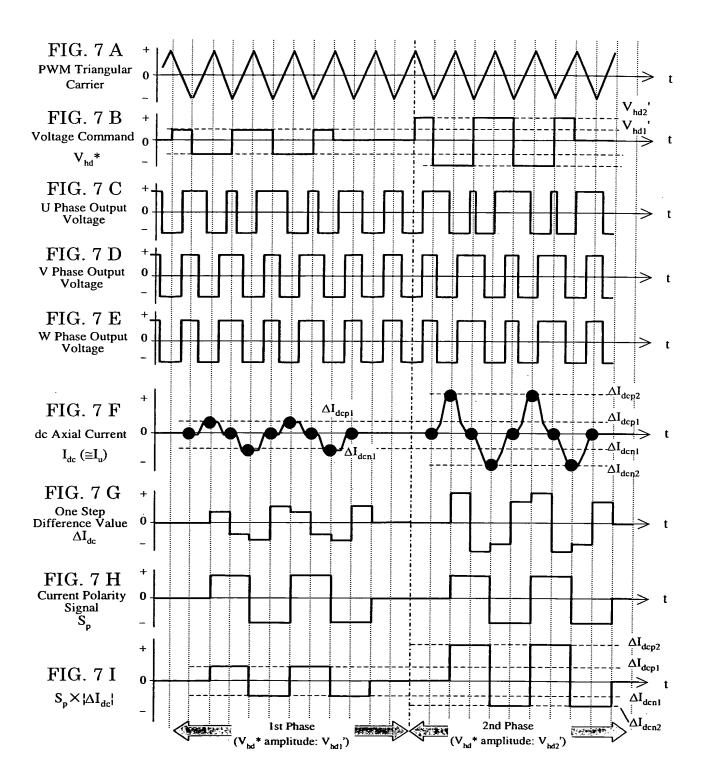


FIG. 8

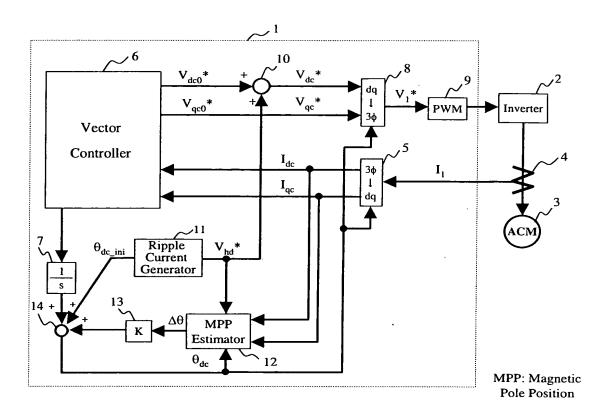
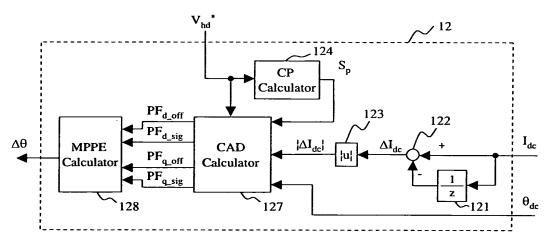


FIG. 9



CP: Current Polarity

CAD: Current Amplitude Difference

MPPE: Magnetic Pole Position Estimation

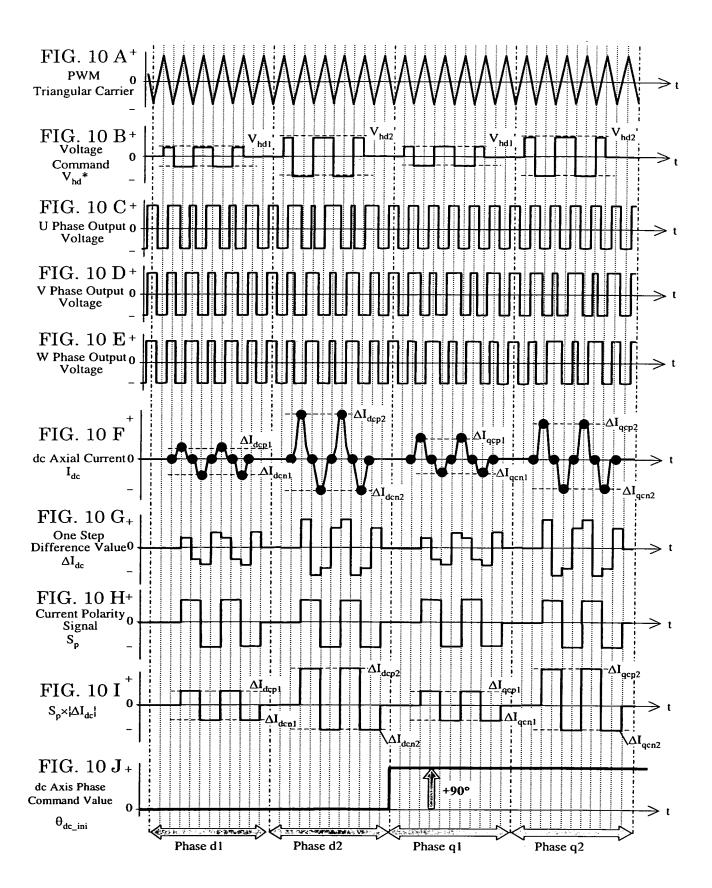
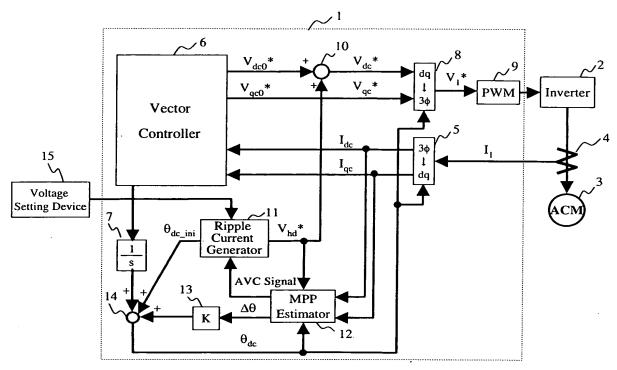


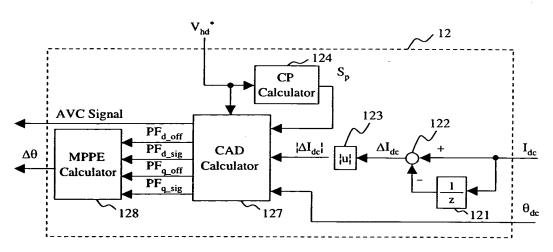
FIG. 11



AVC: Adjustment Voltage Command

MPP: Magnetic Pole Position

FIG. 12



**CP**: Current Polarity

CAD: Current Amplitude Difference MPPE: Magnetic Pole Position Estimation AVC: Adjustment Voltage Command

FIG. 13

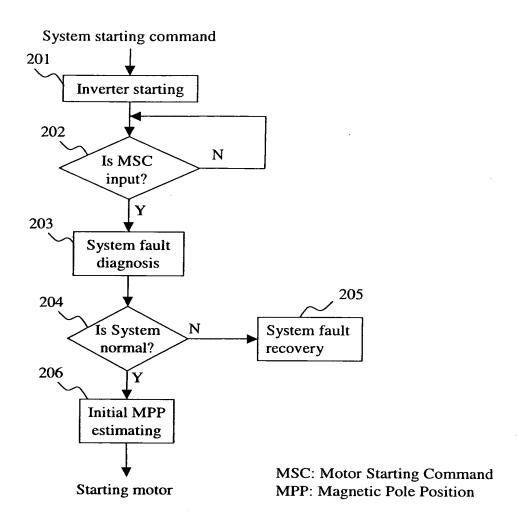


FIG. 14 A

Internal View of Motor

 $\begin{array}{c} -dc \\ \hline \\ \Phi_{m} \\ dc = d \end{array}$ 

FIG. 14 B

## Saturation Characteristic

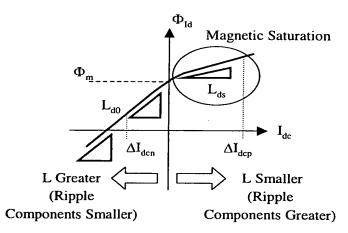


FIG. 14 C

dc Axial Current

